

CLAIMS

What is claimed is :

1 1. A method for estimating a channel, the method comprising the
2 steps of:

3 calculating a least square channel estimate based on a
4 training sequence;

5 calculating an interpolation coefficient, wherein said
6 interpolation coefficient is independent from the statistics
7 of the channel;and

8 estimating the channel based on said interpolation
9 coefficient and said least square channel estimate.

1 2. The method of claim 1, wherein the step of calculating an
2 interpolation coefficient comprises the step of calculating the maximum
3 number of resolvable multiple paths on the channel.

1 3. The method of claim 2, wherein the step of calculating an
2 interpolation coefficient further comprises the step of constructing a
3 receiver multipath power profile of the channel.

1 4. The method of claim 3, wherein the step of calculating an
2 interpolation coefficient further comprises the step of performing a fast
3 fourier transform on said multipath power profile.

1 5. The method in claim 4, wherein the step of calculating an
2 interpolation coefficient further comprises the step of determining an
3 interpolation matrix by constructing a teoplitz of the result of the step of
4 performing a fast fourier transform.

1 6. The method in claim 5, wherein the step of calculating an
2 interpolation coefficient further comprises multiplying said interpolation
3 matrix by said least square channel estimate.

1 7. An apparatus for estimating a channel, the apparatus
2 comprising:

3 an LS estimator for calculating a least square channel
4 estimate based on a training sequence;

5 a coefficient interpolator coupled to said LS estimator,
6 said coefficient interpolator for calculating an
7 interpolation coefficient, wherein said interpolation
8 coefficient is independent from the statistics of the
9 channel; and

10 a channel estimator coupled to said coefficient
11 interpolator, said channel estimator for estimating the
12 channel based on said interpolation coefficient and said
13 least square channel estimate.

1 8. The apparatus of claim 7 wherein said coefficient interpolator
2 further calculates the maximum number of resolvable paths on the channel
3 for use in calculating, said interpolation coefficient

1 9. The apparatus of claim 8, wherein said coefficient interpolator
2 constructs a receiver multipath power profile of the channel for use in
3 calculating said interpolation coefficient.

1 10. The apparatus of claim 9, wherein said coefficient interpolator
2 further performs a fast fourier transform on said multipath power profile to
3 generate a result for use in calculating said interpolation coefficient.

1 11. The apparatus of claim 10, wherein said coefficient
2 interpolator further constructs a teoplitz matrix of the result of said fast
3 fourier transform to generate an interpolation matrix.

1 12. The apparatus of claim 11, wherein said coefficient
2 interpolator further multiplies said interpolation matrix by said least square
3 estimate calculated in said LS estimator to estimate the channel.

1 13. A method for estimating at least one channel, said method
2 comprising the steps of:

3 determining a receiver multipath profile for the at least
4 one channel; and
5 calculating an interpolator coefficient based on said
6 receiver multipath profile.

1 14. The method of claim 13, further comprising the steps of:

2 calculating a least square channel estimate for each at
3 least one channel; and
4 multiplying each least squares channel estimate for
5 each at least one channel by said interpolation
6 coefficient to estimate each at least one channel.

1 15. An apparatus for estimating at least one channel, said apparatus
2 comprising:

3 a coefficient interpolator for determining a receiver
4 multipath profile for the at least one channel and
5 calculating an interpolation coefficient based on said
6 receiver multipath profile.

1 16. The apparatus of claim 15, further comprising:

2 a least squares channel estimator for calculating a least
3 squares channel estimate for each at least one channel;
4 and
5 a channel estimator coupled to said least squares
6 estimator and said coefficient interpolator, said channel
7 estimator for multiplying each least squares channel
8 estimate for each at least one channel by said
9 interpolation coefficient to estimate each at least one
10 channel.

1 17. An OFDM apparatus comprising:

2 means for storing a receiver multipath power profile;
3 and

4 means for calculating an interpolator coefficient based
5 on said receiver multipath power profile.

1 18. The apparatus in claim 16, further comprising:

2 a buffer for storing a training sequence;

3 means for calculating a least square channel estimate
4 from said stored training sequence; and

5 means for combining said least square channel
6 estimate with said interpolator coefficient.